

## CLAIMS

1. A method of forming silicon atomic force microscope tips including the steps of:  
depositing a masking layer onto a first layer of doped silicon so that some square or  
5 rectangular areas of the first layer of doped silicon are not covered by the masking  
layer,  
etching pyramidal apertures in the first layer of doped silicon,  
removing the masking layer,  
depositing a second layer of doped silicon onto the first layer of doped silicon, the second  
10 layer of doped silicon being oppositely doped to the first layer of doped silicon, and  
etching away the first layer of doped silicon.
2. A method of forming silicon atomic force microscope tips as claimed in claim 1  
wherein the final etch is an electrochemical etch.
- 15 3. A method of forming silicon atomic force microscope tips as claimed in claim 1 or  
claim 2 wherein the first layer of silicon is p-type doped silicon and the second layer of  
silicon is n-type doped silicon.
- 20 4. A method of forming silicon atomic force microscope tips as claimed in claim 1 or  
claim 2 wherein the first layer of silicon is n-type doped silicon and the second layer of  
silicon is p-type doped silicon.
5. A method of forming silicon atomic force microscope tips as claimed in any one of  
25 claims 1 to 4 wherein the pyramidal apertures are etched using a strong base etchant.
6. A method of forming silicon atomic force microscope tips as claimed in claim 5  
wherein the strong base etchant is potassium hydroxide.
- 30 7. A method of forming silicon atomic force microscope tips as claimed in claim 5  
wherein the strong base etchant is tetramethyl ammonium hydroxide.



8. A method of forming silicon atomic force microscope tips as claimed in claim 5 wherein the strong base etchant is ethylene diamine pyrochatecol.

9. A method of forming silicon atomic force microscope tips as claimed in any one of  
5 claims 1 to 8 further including the steps of:

before the first layer of doped silicon is etched performing an anisotropic wet etch on the second layer of silicon to provide at least one raised area,

fusion bonding a third layer of silicon over the raised area to form at least one cavity between the second layer and the third layer,

10 following the step of etching away the first layer of doped silicon depositing a masking layer over the second layer of silicon on the side previously in contact with the first layer of silicon,

patterning the masking layer to include an area of no masking at one side of a tip,

performing a release etch to remove silicon above the cavity not covered by the masking

15 layer, and

removing the masking layer.

10. A method of forming silicon atomic force microscope tips as claimed in claim 9 wherein the third layer of silicon has the same doping as the second layer of silicon.

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